

APRIL 25, 1989
NARRATIVE FOR
MILES CITY-TONGUE RIVER
OIL AND GAS DEVELOPMENT POTENTIAL MAP

INTRODUCTION:

The Miles City-Tongue River oil and gas development potential map covers portions of the Big Dry, Billings, and Powder River Resource Areas. This area includes parts of Big Horn, Custer Powder River, Rosebud and Treasure Counties Montana. Also within this limit is the eastern segment of the Northern Cheyenne Indian Reservation. Lands within this reservation are not discussed in this report.

Topography is open flat grasslands with the Yellowstone River bisecting the north-central portion of the area in an east-west direction.

Regional geology shows that a major part of the surface outcrops are Tertiary Fort Union with Upper Cretaceous rocks outcropping along the major drainage systems (Ross, and others, 1955). The Pre-Cambrian basement forms a structural saddle in a northwest-southeast direction that separates the Williston and Powder River basins. The structural depth of the crystalline basement is - 5000 to -6000 feet below mean sea level (Mallory, 1972). These rocks are overlain by almost a complete section of Paleozoic and Cretaceous rocks in excess of 5,000 feet thick (Mallory, 1972). Structurally, three major features are mapped across this area (Dobbin and Erdmann, 1955); the Porcupine Dome and Miles City Arch in the north, and the northern limit of the Powder River Basin in the south. Minor structural features are also noted within these major structural trends.

There have been 181 wells drilled in the this portion of Montana in the past 15 years. Currently, there are two gas fields located in the eastern portion of map, Pumpkin Creek and Liscom Creek. Both of these fields are on the northern limit of the Powder River Basin and were discovered in the 1950's. They produce from the Upper Cretaceous Eagle and Shannon Sandstones.

OCCURRENCE POTENTIAL:

All of the Miles City-Tongue River area is classified as high occurrence potential. This classification is based on: 1) a sedimentary package of Paleozoic and Cretaceous rocks in excess of 5,000 feet thick (Mallory, 1972), and that several formations within this package that are productive in this area and elsewhere in the state, and 2) a geologic setting which may have potential for structural and stratigraphic traps.

DEVELOPMENT POTENTIAL:

The Miles City-Tongue River area has five townships classified as high development potential. This is based on the established production and/or significant hydrocarbon shows from past drilling within those townships. Also, due to the geologic setting there exists possible structural and stratigraphic traps within those townships. The remaining townships are classified as moderate development potential based on: 1) the presence of a thick sedimentary package that is productive within the area and elsewhere in the state, 2) the geologic setting, with possible structural and stratigraphic traps, and 3) the lack of drilling data and established production.

Based on the geologic setting and the past activity, it is expected that this area will have a moderate level of surface disturbance due to drilling activity over the next 15 years. This activity could included the drilling of one to eight wells in any given township.

REFERENCE CITED

Mallory, W. W., (ed.) 1972, Geologic atlas of the Rocky Mountain Region: Rocky Mountain Association of Geologists, p.56.

Ross, C., Andrews, D., Witkind, I., (compilers), 1955, Geologic map of Montana: U.S. Geological Survey, map, 2 sheets, scale 1:500,000.